

## A KEY TO SPECIES OF PSOCIDS OF THE *LACHESILLA CORONA* GROUP (PSOCOPTERA: LACHESILLIDAE) IN EASTERN MEXICO, WITH DESCRIPTIONS OF TWO NEW SPECIES<sup>1</sup>

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**ABSTRACT:** Seven species of the *Lachesilla corona* species group in eastern Mexico are keyed using adult characters of both sexes where known. Two species are new and are described: *L. picticeps* and *L. dispariforceps*. *L. dividiforceps* García Aldrete (name emended from the original *dividiforceps*), closely related to the new species, is redescribed to allow detailed comparison with its close relatives.

Psocid material collected or received for determination from eastern Mexico includes two undescribed species in the *Lachesilla corona* group. These are described here along with their close relative, *L. dividiforceps* García Aldrete. Several species of this group in eastern Mexico also have been described by García Aldrete (1973, 1974b, c, d, 1982). The present paper provides a key to the seven known species of the area.

### MATERIALS AND METHODS

Descriptions are based on examination of 15 adult specimens of the two new species (12 of *L. picticeps* n.sp. and three of *L. dispariforceps* n.sp.) and 14 adults of *L. dividiforceps*. Illustrations were executed with the aid of a drawing tube or microprojector. Measurements were made on slide-mounted parts with a filar micrometer. The micrometer unit for wing measurements was 2.63  $\mu\text{m}$  and for all other measurements 0.987  $\mu\text{m}$ . Leg measurements were made condyle to condyle. The desire to keep as many specimens as possible intact for subsequent investigation has dictated that only a minimal number be dissected for measurement. Color descriptions were prepared from observations through a dissecting microscope with direct light on specimens preserved from their time of capture in 80% ethanol.

Use of "phallic apodemes" instead of "parameres" in the key and descriptions is based on Mockford's (1985) interpretation of male external genitalia in this genus.

#### *Lachesilla corona* group García Aldrete 1974a

García Aldrete (1974a) noted the close affinity of the *corona* and *rufa*

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species groups and listed several characters shared by the two groups. These include 1) a mesal flap on the female subgenital plate, 2) four mesal macrosetae on the subgenital plate, 3) distal ends of the gonapophyses conical, 4) the posterior margin of the hypandrium concave and edged in a sclerotized rim, 5) two mesal macrosetae near the posterior margin of the hypandrium, and 6) the male paraprocts each with a mesal prong. In addition to these characters, males of both groups have a transverse sclerotized region on one or more abdominal sterna anterior to the hypandrium. Where this character is well developed (as in *L. dividiforceps* García Aldrete and the new species described below) it is seen on sterna 3 to 7 with the region of sternum 7 (Figs. 3, 8, 11) somewhat more heavily sclerotized than those anterior to it.

Separation of the two groups is currently based on only one character: the flap of the female subgenital plate is entire in the *corona* group and cleft distally in the *rufa* group. Obviously, a thorough review of the species is necessary in order to establish the phylogenetic relationship between these two groups.

## DESCRIPTIONS

The three species described below, *L. dispariforceps* n. sp., *L. picticeps* n. sp., and *L. dividiforceps*, share a common color pattern, which is described only for the first species. The pretarsal claw is developed in the same way in the three species and is described and figured only for the first species.

### *Lachesilla picticeps* n. sp.

Male measurements: Table 1.

Male structural features: Pretarsal claw (Fig. 1) with pulvillus slender with a slight bend in basal half, slightly expanded at tip. Forewing (Fig. 2) with venation typical of the genus; r-m junction by a short fusion, at a point, or by a short crossvein; ratio of height to length of areola postica = 0.53 in specimen illustrated. Hypandrium (Fig. 3) broad, quadrate, partially divided along intersegmental line 8-9, terminating distally in broad-based claspers; the latter tapering and curved inward distally, each bearing a tooth on its outer margin well before tip. Phallic apodemes (Fig. 3) completely separate, close together basally, curving laterad in middle then mesad near tips; tips abruptly pointed; several minute tubercles and denticles present immediately before tip. Epiproct (Fig. 4) transverse, heavily sclerotized laterally, with a prong on each side near distal margin. Paraproct (Fig. 4, ventral one-third doubled under in mounting) well sclerotized basally, bearing a distal prong; sense cushion bearing 8-10 trichobotria with basal florets and usually a simple, empty setal socket in basal area, or this socket bearing a short seta. Clunium (Fig. 4) with area of unpigmented cuticle bordering epiproct medially.

Male color (in alcohol): Compound eyes black. Ground color of head and body creamy white. Head with reddish brown W-shaped mark centered in front of ocellar interval, following

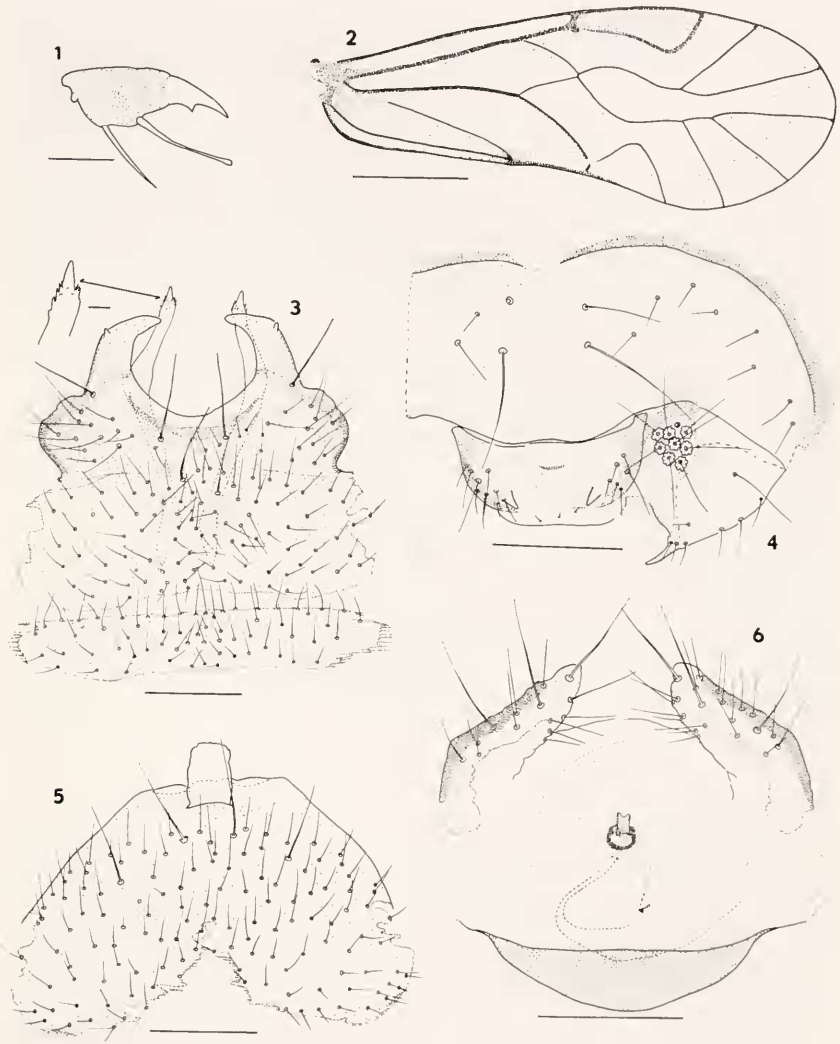


Fig. 1-6. *Lachesilla picticeps* n. sp. Fig. 1. ♂, hind pretarsal claw, scale = 0.01 mm. Fig. 2. ♂, Forewing, scale = 0.5 mm. Fig. 3. ♂, hypandrium (abdominal sterna 7-9) and phallic apodemes, scale = 0.1 mm (scale of insert = 0.01 mm). Fig. 4. ♂, clunium, epiproct, and right paraproct, scale = 0.1 mm. Fig. 5. ♀, subgenital plate, scale = 0.1 mm. Fig. 6. ♀, ovipositor valvulae and ninth sternum, scale = 0.1 mm.

frontal ecdysial arms to clypeus, then passing to compound eye dorsad of antennal base; a brown bar below each antennal base; a tawny brown bar from posterior margin of each parietal area forward a short distance but separated from a purplish brown spot to each side of ocellar interval; a spot of tawny brown paralleling each compound eye dorsomedially; labrum, postclypeus, and antennae tawny brown; maxillary palpi dark brown. Thorax variegated ground color and tawny brown, the latter on notal lobes, on pleura below wing bases, and on legs; a dark reddish-brown line running length of thorax above leg bases. Forewing (Fig. 2) with a dark brown mark along posterior border of pterostigma in its distal half; a slight tawny wash over entire surface of forewing slightly darker on pterostigma and at marginal ends of veins. Hindwing with uniform slight tawny wash over entire surface. Abdomen of ground color except segments 3-9 each with a transverse dark reddish brown ring, broadly interrupted ventrally; sclerotized abdominal sterna 3-7 and hypandrium tawny brown; a narrow dark reddish brown band along dorsal midline from second to tenth tergum.

Female measurements: Table 1.

Female structural features: Pretarsal claws and wing venation as in male. Subgenital plate (Fig. 5) a weakly sclerotized trapezoidal area with relatively shallow anterior indentation; four long setae near distal end of plate; flap of subgenital plate moderately wide, bearing minute denticles on distal margin; ratio of greatest width of plate to width of flap half-way along its length 9.2 and 14.3 in two specimens measured. Ninth sternum (Fig. 6) with anterior margin a rounded doubled membrane; a broad region around spermapore lightly sclerotized and a small ring immediately around spermapore heavily sclerotized. Third valvulae (Fig. 6) simple, conspicuous, well sclerotized on lateral margins, bearing numerous setae.

Female color (in alcohol): Same as in male except abdominal sterna weakly sclerotized and colorless.

Types: Holotype ♂ allotype ♀, 5♂ and 5♀ paratypes, Mexico: Nuevo León: Villa de Santiago 34 km SE Monterrey on Highway 85, VII-1980; on apple trees, M.I. Treviño collector. The types are in my collection and will be ultimately deposited in the Florida Collection of Arthropods, Florida Department of Agriculture and Consumer Services, Gainesville, Florida. A pair of paratypes will be deposited in the collection of Dr. A.N. García Aldrete, Mexico City.

### *Lachesilla dispariforceps* n. sp. (♂)

Male measurements: Table 1.

Male structural features: Forewing (Fig. 7) differing from preceding species in deeper pterostigma, more curved  $Cu_1$ , and relatively higher areola postica, height to length ratio of areola postica = 0.59 in specimen illustrated. Hypandrium (Fig. 8) broad, quadrate, its eighth-sternum component somewhat broader than that of ninth; terminating distally in broad-based claspers, the latter bifid near base, the outer ramus shorter and slenderer than inner one. Phallic apodemes (Fig. 8) as described for previous species except slightly more pointed distally. Epiproct, paraproct, and clunium (Fig. 9) much as in previous species; epiproct with prongs shorter, closer together, and relatively slenderer. Paraproct with 10 trichobothria in sense cushion having basal florets and one short trichobothrium with simple base. Clunium with area of clear cuticle bordering epiproct shallower than in previous species.

Male color (in alcohol): As described for preceding species including head markings (Fig. 10).

Types: Holotype ♂ and two ♂ paratypes, Mexico: Hidalgo: Highway 85, 38.6 km NE central square of Rancho Viejo, 22-VI-1962, beating forest vegetation, coll. E.L. Mockford, J.M. Campbell, and F. Hill. The types are in my collection and will be ultimately deposited in the Florida Collection of Arthropods, Florida Department of Agriculture and Consumer Services, Gainesville, Florida.

*Lachesilla dividiforceps* García Aldrete

*Lachesilla dividiforceps* García Aldrete 1974:79 (name here emended as indicated by García Aldrete, *in litt.*)

Male measurements: Table 1.

Male structural features: Forewing as described for previous species, differing from *L. picticeps* n. sp. in deeper pterostigma, more curved  $Cu_1$ , and relatively higher areola postica, its height to length ratio being 0.59 in single specimen measured. Hypandrium (Fig. 11) broad, quadrate, components of the eighth and ninth sternum of about the same width, partially separated along intersegmental line; terminating distally in pair of broad-based claspers each bifid near base, both rami slender, the inner longer than outer. Phallic apodemes (Fig. 11) completely separate, close together basally, directed outward in basal two-thirds, parallel in distal one-third; tips acuminately pointed. Epiproct (Fig. 12) with prongs developed as in *L.*

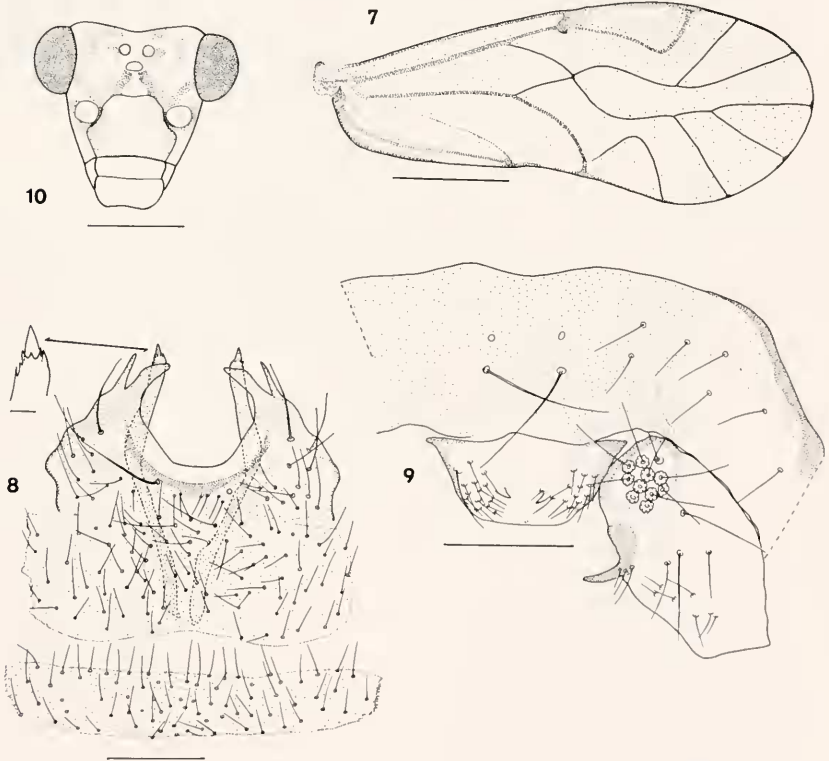


Fig. 7-10. *Lachesilla dispariforceps* n. sp. ♂. Fig. 7. Forewing, scale = 0.5 mm. Fig. 8. Hypandrium (abdominal sternite 7-9) and phallic apodemes, scale = 0.1 mm (scale of insert = 0.01 mm). Fig. 9. Clunium, epiproct, and right paraproct, scale = 0.1 mm. Fig. 10. Head in anterior view, scale = 0.5 mm.



*dispariforceps* n. sp.; each prong surrounded by a field of minute papillae. Paraproct (Fig. 12); sense cushion bearing 9-10 trichobothria with basal florets and one short basal trichobothrium with simple base. Paraproctal prong pointed apically. Clunium with no area of clear cuticle bordering epiproct.

Female measurements: Table 1.

**Female structural features:** Forewings as described for male. Subgenital plate (Fig. 13) a weakly sclerotized quadrate area with sides slightly indented and anterior indentation deeper than in *L. picticeps* n. sp. Flap of subgenital plate extremely slender, ratio of greatest width of subgenital plate to width of flap half-way along its length 45.0 and 51.5 in two specimens measured. Ninth sternum (Fig. 14) with anterior margin a doubled membrane broadly rounded in middle with two rounded lateral lobes; a small sclerotized ring around spermapore. Third valvulae (Fig. 14) simple, conspicuous, well sclerotized on lateral margins, slightly curved outward at tips, bearing numerous setae.

**Material examined:** Mexico: Hidalgo: Highway 85, 38.6 km NE central square of Rancho Viejo, 22-VI-1962, beating forest vegetation, 1 ♂, 1 ♀; coll. E.L. Mockford, J.M. Campbell, and F. Hill; Nuevo León: Chipinque Mesa 13. 7 km SW center of Monterrey, 23-X-1963, beating asteraceous plants, el. 915 m, 2 ♂, 6 ♀ (holotype, allotype, and paratypes), coll. E.L. Mockford; Villa de Santiago, Highway 85, 34 km SE Monterrey, VI-VII-1980, on apple trees, 3 ♂, coll. M.I. Treviño; San Luis Potosí: Highway 80, 12.6 km W. Naranjo, 20-VI-1962, beating understory plants in oak forest, 1 ♂, coll. E.L. Mockford.

### Key to Species

Seven described species in the *corona* group, including the two new species described here, are now known from eastern Mexico. They may be keyed as follows:

1. Phallic apodemes either separated their entire length and held close together by a membrane or fused only at their extreme base; greatest width of flattened female subgenital plate divided by width of its flap midway along its length  $\geq 9$  . . . . . 2
- Phallic apodemes fused throughout approximately their basal one third; greatest width of female subgenital plate divided by width of its flap midway along its length  $< 5$  . . . . . 6
2. Phallic apodemes fused at extreme base; claspers neither divided nor bearing a tooth; ninth sternum of female either decidedly tapering anteriorly or slightly tapering and truncated anteriorly . . . . . 3
- Phallic apodemes separate their entire length, held close together only by membrane; claspers either divided or with a tooth on their outer margins (Figs. 3, 8, 11); ninth sternum of female (where known) wide and curved anteriorly. . . . . 4
3. Phallic apodemes knobbed and bristly on distal ends; claspers knobbed distally; female ninth sternum slightly tapering and truncated anteriorly. . . . .
- . . . . . *L. hermosa* García Aldrete.
- Phallic apodemes slender and acuminate pointed distally; claspers acuminate pointed distally; female ninth sternum decidedly tapering anteriorly, rounded at anterior extreme. . . . . *L. neoleonensis* García Aldrete.
4. Claspers clearly divided (Figs. 8, 11); female (where known) with flap of subgenital plate extremely slender (Fig. 13) . . . . . 5
- Claspers not divided but with a tooth on outer margin (Fig. 3); female with flap of subgenital plate broader (Fig. 5) . . . . . *L. picticeps* n. sp.
5. Median ramus of clasper broader than lateral (Fig. 8); phallic apodemes bearing minute denticles near their distal end (Fig. 8) . . . . . *L. dispariforceps* n. sp.
- Median ramus of clasper about same width as lateral (Fig. 11); phallic apodemes lacking minute denticles near their distal end (Fig. 11). . . . .
- . . . . . *L. dividiforceps* García Aldrete.

6. Claspers curving medially from base to tip; greatest width of flattened female subgenital plate divided by width of its flap midway along its length  $< 3.5$  . . . . . *L. regiomontana* García Aldrete.  
 — Claspers curving in a wide arc medially in basal half then laterally in distal half; greatest width of female subgenital plate divided by width of its flap midway along its length  $> 4.0$  . . . . . *L. curviforceps* García Aldrete.

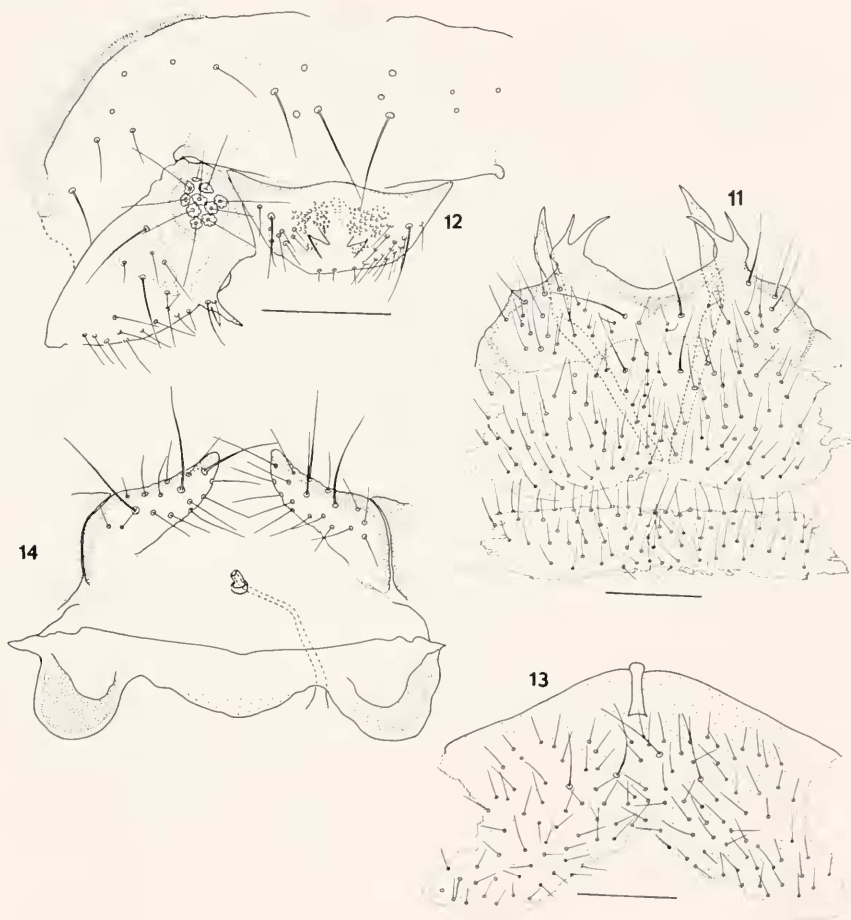


Fig. 11-14. *Lachesilla dividiforceps* García Aldrete. Fig. 11. ♂, hypandrium (abdominal sterna 7-9) and phallic apodemes, scale = 0.1 mm. Fig. 12. ♂, clunium, epiproct, and left paraproct, scale = 0.1 mm. Fig. 13. ♀, subgenital plate, scale = 0.1 mm. Fig. 14. ♀, ovipositor valvulae and ninth sternum, scale of Fig. 12.

Table 1. Measurements ( $\mu\text{m}$ ), ctenidial counts, and head-width: eye ratio for three species of the *Lachesilla corona* group.

Species & Sex	Locality	FW <sup>1</sup>	HW	F	T	t <sub>1</sub>	t <sub>2</sub>	t <sub>1</sub> ct	f <sub>1</sub>	f <sub>2</sub>	f <sub>3</sub>	f <sub>4</sub>	IO/d
<i>L. picticeps</i> ♂	Santiago, N.L.	2304	1744	445	808	284	113	22	258	244	194	152	4.16
<i>L. picticeps</i> ♂	Santiago, N.L.	2341	1796	445	840	290	106	22	262	248	—	—	2.60
<i>L. picticeps</i> ♀	Santiago, N.L.	2001	1567	441	797	276	112	17	242	230	187	138	3.11
<i>L. picticeps</i> ♀	Santiago, N.L.	1941	1470	404	750	253	106	17	218	192	167	117	2.77
<i>L. dispariforceps</i> ♂	nr. Rancho Viejo, Hidalgo	2178	1654	448	840	301	107	18	275	257	209	172	2.89
<i>L. dispariforceps</i> ♂	nr. Rancho Viejo, Hidalgo	1936	1515	407	734	265	99	21	251	229	191	153	2.77
<i>L. dividiforceps</i> ♂	Santiago, N.L.	2135	1631	435	792	289	102	21	270	231	—	—	2.90
<i>L. dividiforceps</i> ♂	nr. Naranjo, SLP	2020	1496	392	760	257	93	20	240	225	190	148	2.61
<i>L. dividiforceps</i> ♀	Chipinque, N.L.	2164	1654	436	826	281	110	19	239	232	189	139	3.25
<i>L. dividiforceps</i> ♀	nr. Rancho Viejo, Hidalgo	2028	1549	405	756	259	101	19	230	211	173	126	2.87

<sup>1</sup> FW = forewing length; HW = hindwing length; F = hind femur length; T = hind tibia length; t<sub>1</sub>, t<sub>2</sub> = lengths of hind first and second tarsomeres; t<sub>1</sub>ct = number of ctenidia (comb-based setae) on hind first tarsomere; f<sub>1</sub> ... f<sub>4</sub> = length of first ... fourth flagellomere; IO/d = shortest distance between eyes divided by transverse diameter of eye in anterior view.

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